

Address from NASA Headquarters

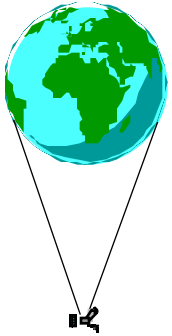
Dr. Peter Ulrich

Director

Advanced Technology and Mission Studies Division

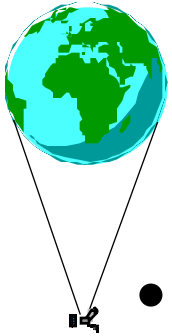
Office of Space Science

Second ULDB Technology Workshop
November 12, 1998



General Observations

- It appears that ULDBs have the potential to cost effectively (1) expand our technology qualification program and (2) offer added scientific measurement capabilities
- Technology Roadmaps have been generated based on identified Mission and Science Requirements
- Now it is important to take advantage of this previous work and begin to insert this information into one or more of the existing opportunities for funding

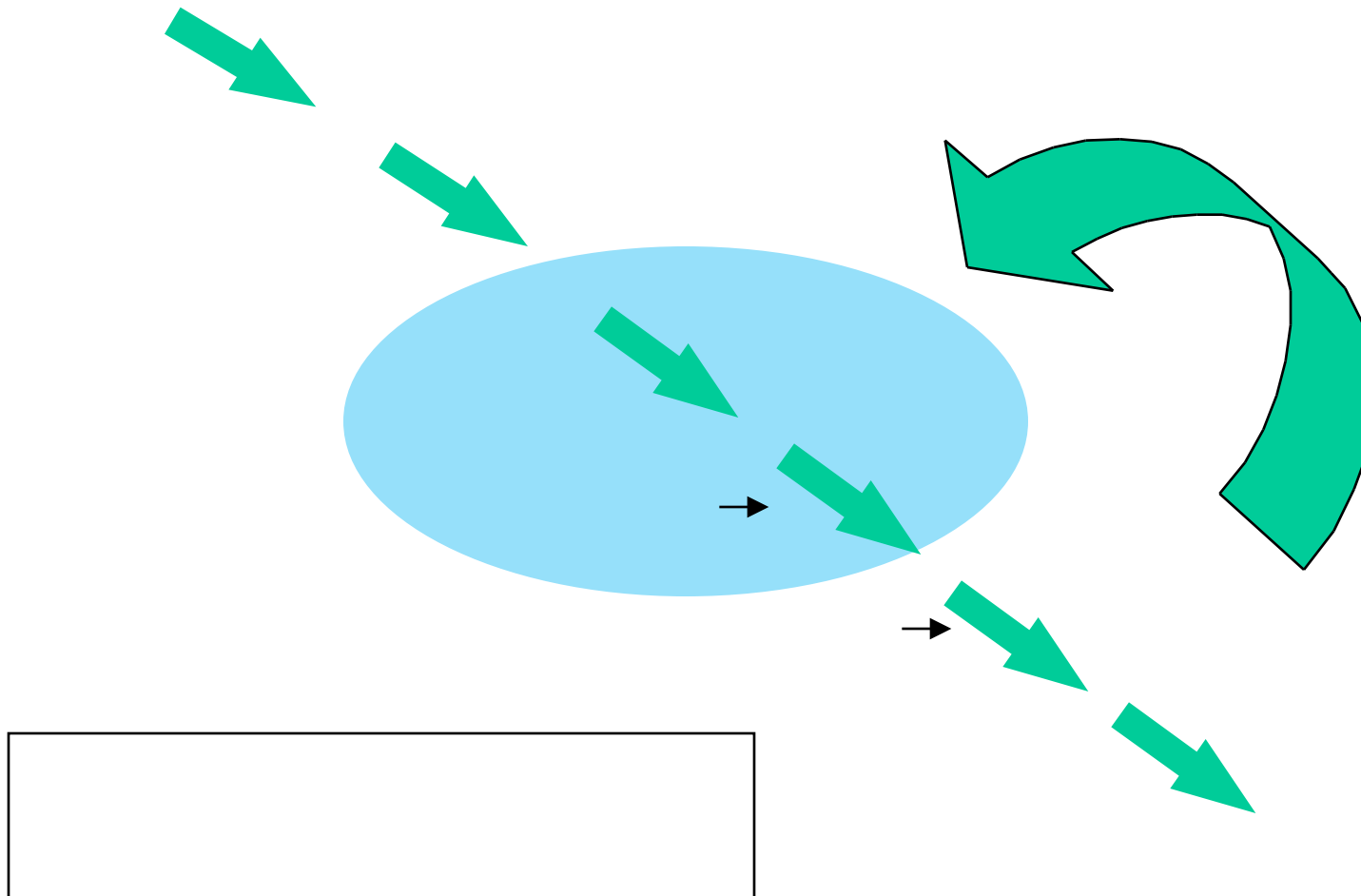


Technology Development Opportunities for ULDB

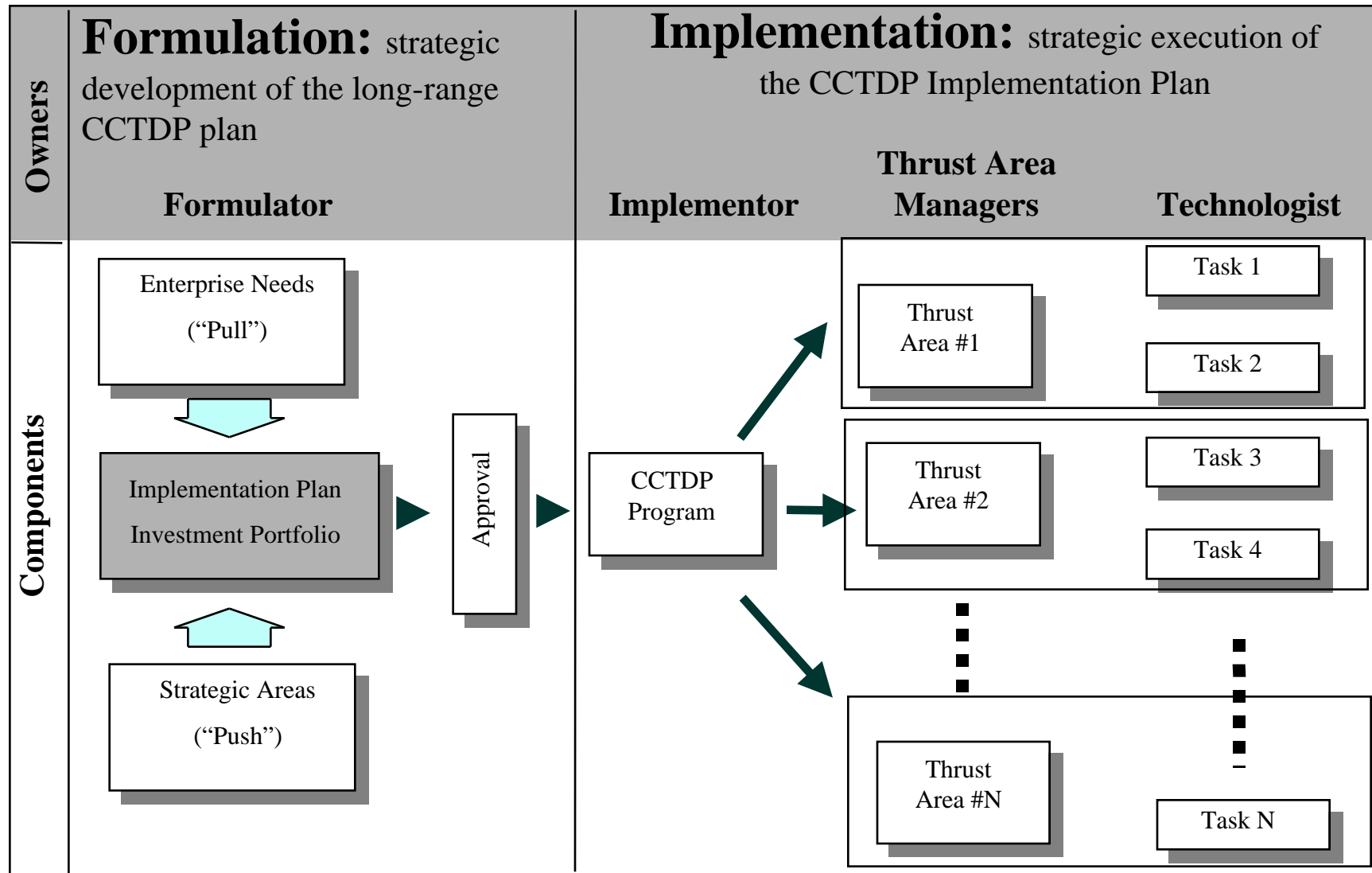
- NASA Institute for Advanced Concepts
 - Seeks Radical New Systems and Architectures
 - See URL: <http://www.niac.usra.edu/>
 - New research announcement soon
- Cross Enterprise Technology Development
 - Technology Readiness Levels 1-3
 - New, *Untested* process for a venerable program
- Explorer Technology Program
 - Technology Readiness Levels 4-6
 - Explorer AOs include Long Duration Balloons
- Code SR Suborbital Flight Program
 - Higher TRLs, but also used for tech demo

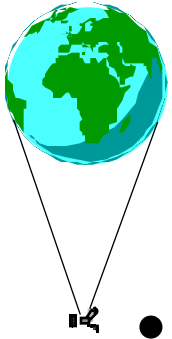
CROSS ENTERPRISE TECHNOLOGY DEVELOPMENT PROGRAM

INVESTMENT DECISION FLOW



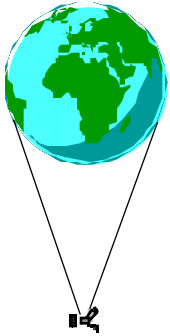
CETDP Program Overview



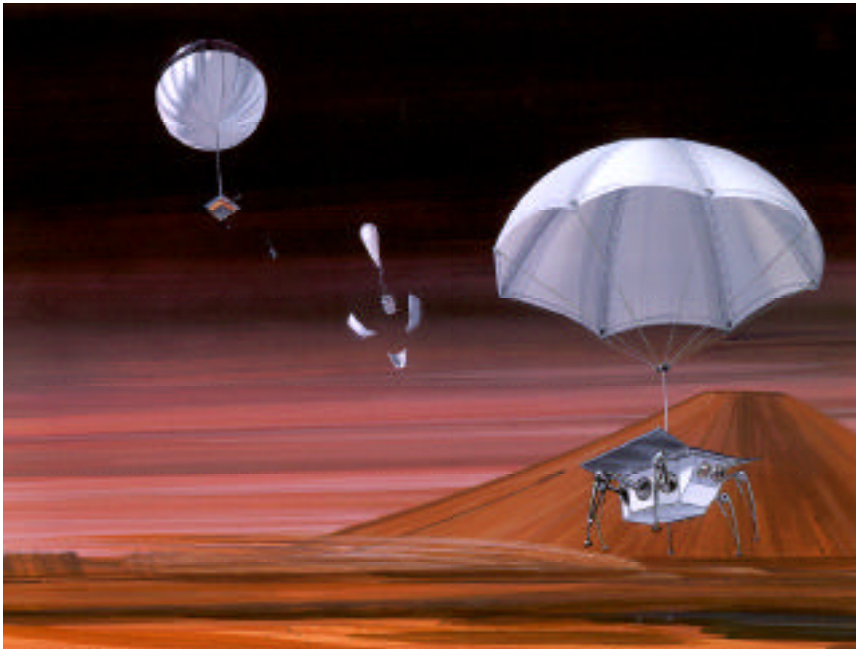


Where to Next?

- There are other planets besides Earth
- Consider ULDB as testbed for Planetary Aerobots
- Balloons have been proposed for Mars -- little atmosphere, but also only 1/3 gravity.
- Balloons on Venus have been proposed-- gives new meaning to “Superpressure”
- Balloons are the only way to operate on gas giants beyond the asteroid belt...

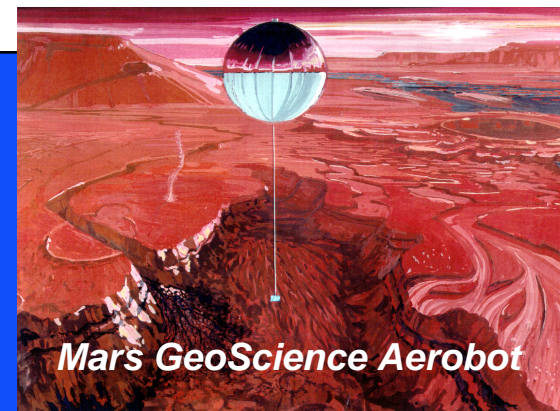


Mars Aerobot Micro Explorers



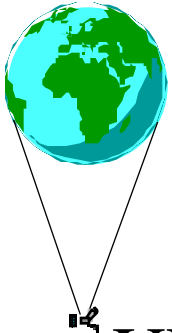
- **Mars Geoscience Aerobot Could Circumnavigate Mars at 5-8 km Altitude**
- **Experimental and High Technology Payloads Could Include Miniature Meteorology Stations, Subsurface Penetrators and Explorers, and Nano-scale Rovers or *Hexabots***
- **Micro Explorers Could Be Dispersed Widely on the Surface of Mars Given the 10-15 Full Longitude (30-60 Lat) Traverses of the Aerobot**

- **Micro Explorers are deployed as Buoyancy Ballast on Mars Geoscience Aerobot**
- **Several (10-20) < 500 g Micro Payloads Can Be Deployed from Central Ballast Revolver in Gondola**



Mars GeoScience Aerobot

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Conclusions

- ULDBs have great potential utility for NASA
- There are opportunities to begin funding ULDB programs
 - There are also well-defined processes (NRAs, CETDP) to get support
- The ULDB community now needs to build on the groundwork developed thus far to coordinate and develop science advocacy, to actively participate in the various NRA programs, and to flow down technology needs to the CETDP through the Enterprise entry points